UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,530	01/06/2004	Junichi Komagata	SON-2895	3306

23353   7590   12/23/2008
RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

EXAMINER
SOL, ANTHONY M

ART UNIT	PAPER NUMBER
2419	

MAIL DATE	DELIVERY MODE
12/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>15 September 2008</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1,3,4,6 and 9-14</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1, 3, 4, 6, and 9-14</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>15 September 2008</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Applicant's Amendment filed 9/15/2008 is acknowledged.

- No claims have been amended.

- Claims 9-14 have been added.

- Claims 1, 3, 4, 6, and 9-14 are now pending.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1, 4, 9, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated

by U. S. Patent No. 6,560,230 B1 ("Li").

Regarding claims 1, 4, 9, and 12,

Li shows in fig. 5A a storing portion 55 for storing first packets that compose the

real time streams (fig. 4, voice 40) and second packets that compose the non-real time

stream (fig. 4, HTTP 48 and other 46) so that a first-in-first-out operation is respectively

performed for every stream (col. 8, lines 47-48, *Queues 55 are logical first in, first out*

("FIFO") queues); and a counter portion for counting (col. 4, lines 39-40, *a **counter** for*

maintaining a virtual time for the scheduling engine) an interval time (col. 10, lines 1-5, *If*

a packet 51 of length L were transmitted at a rate R, its transmission will be completed

*after an **interval I** given by: I=L/R)* of the first packets for every said real time stream;

and a scheduler portion for transmitting the first packets stored for every said real time

stream in the storing portion every said interval time period (col. 4, lines 39-49, *a*

***scheduling engine** adapted to select one packet from a plurality of packets at the*

heads of the queues), calculating a transmission end time of the first packets from the

interval time and a transmission time of the first packets of each of the real time streams

for every said real time stream and transmitting a first packet whose transmission end

time is the earliest in the first packets when the transmission times of the first packets

overlap (col. 11, lines 46-48, *A simplified method is possible whereby leaf scheduling*

*engine 60 simply selects for transmission the packet which has the **smallest finish***

***time F;** col. 13, lines 35-44, The method continues by passing the one high priority*

packet having the smallest finish time F (fig. 8, step 206), and transmitting the second

packets when the transmission intervals of said first packets are longer than the

transmission times of the second packets (see col. 15, lines 22-29, *When a parent*

*scheduling engine 60 selects a packet from one of its child scheduling engines 60, **it***

***initially considers only the highest priority packets being held** by the child*

*scheduling engines 60. **If none of those packets are eligible, it considers the next***

***highest priority packets being held by the child scheduling engines 60**)*.

In addition for claims 9 and 12, Li shows in fig. 5 memory buffers 55 which

perform FIFO operations (col. 8, lines 47-48), scheduler 50 (col. 4, lines 36-49), which

comprises a counter (col. 4, lines 39-40), a calculator (col. 4, lines 34-35, *means for*

keeping a start time, a finish time and a priority for a packet at a head of each of the

queues), and a transmitter 58 (col. 8 lines 54-60)(see at least col. 4, lines 28-51, col. 8,

lines 26-60).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 3, 6, 11, and 14 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Li in view of U.S. Patent No. 5,539,729 ("Bodnar").

        Regarding claims 3, 6, 11, and 14

        LI discloses When a parent scheduling engine 60 selects a packet from one of its

child scheduling engines 60, it initially considers only the highest priority packets being

held by the child scheduling engines 60. If none of those packets are eligible, it

considers the next highest priority packets being held by the child scheduling engines

60. The parent scheduling engine 60 continues checking for packets of ever lower

priority until it finds an eligible packet. *If no eligible packets are found, but the child*

scheduling engines 60 are holding on to one or more packets, **the virtual time of the**

parent scheduling engine 60 is advanced to the earliest start time *of those packets*

being held (claimed a scheduler portion is configured to treat times shorter than the transmission times of the second packets as new transmission times of the second packets)(see col. 15, lines 22-34).

Li does not disclose that this step occurs when the second packets are not transmitted while a predetermined number of the first packets are transmitted.

Bodnar discloses that a counter is associated with the higher priority packet stream, so that **when the counter reaches a predetermined number, the higher priority packet stream is disabled**, **so that the lower priority packet stream may be processed**. Advantageously, the counter may be set to a predetermined value and then decremented, so that when the counter reaches zero, the higher priority packet stream is disabled. Advantageously, a predetermined number of lower priority packets are processed before processing is re-enabled on the higher priority packet system and the counter reset. Advantageously, when the higher priority packet stream is interrupt-driven, interrupts are disabled and then enabled after a predetermined number of packets are processed from the lower priority stream (see col. 3, lines 9-27).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the reverse packet scheduling method of Li to use a counter to limit processing of high priority packet stream in order to process lower priority packet stream as taught by Bodnar. One skilled in the art would have been motivated to make the combination in order to transmit "real time" packets with very small delays but which can also schedule the transmission of non-real time packets fairly (see Li, col. 3, lines 50-53).

5.   Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Pub. No. US 2003/0119556 A1 ("Khan").

Regarding claims 10 and 13,

Li does not disclose treating packets of non-real time stream as if their transmission end times were earlier when packets of non-real-time streams are not transmitted after a predetermined time has elapsed.

Khan discloses that lower priority packets may be immediately "promoted" and sent after a predetermined time period has passed even though other higher priority packets are waiting transmission in higher priority sub-queues 112 (claimed treating packets of non-real time stream as if their transmission end times were earlier)(para. 22).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the reverse packet scheduling method of Li to immediately promote lower priority packets after a predetermined time period has passed as taught by Khan. One skilled in the art would have been motivated to make the combination in order to transmit "real time" packets with very small delays but which can also schedule the transmission of non-real time packets fairly (see Li, col. 3, lines 50-53).

Response to Arguments

6.   Applicant's arguments filed 9/15/2008 have been fully considered but they are

not persuasive.

-        The applicant argues on pg. 11 of Remarks that Li's disclosure makes no

mention of transmitting second packets that compose the non-real time

streams when the transmission intervals of first packets that compose the

real-time streams are longer than the transmission times of the second

packets.

-        The examiner respectfully disagrees. Initially, note that Li states that the

basis for his invention is that there is a need for a fast scheduling method and

apparatus which can transmit "real time" packets with very small delays but

which can also schedule the transmission of non-real time packets fairly (col.

3, lines 50-53). In regards to second packets that compose non-real time

streams, Li discloses a simple two level priority scheme, as shown in the

priority tree of FIG. 4, designating high priority classes as "real-time" and

lower priority classes as "best effort". Note that "real time" streams are voice

40 (claimed first packets) and "best effort" streams are HTTP 48 and Other

46 (claimed second packets that compose non-real time streams). Li further

discloses that high priority is assigned to classes that require small

transmission delays. Lower priorities are assigned to classes that can

tolerate larger delays (col.12, lines 40-59).

As for transmitting the non-real time packets when the transmission intervals of the first packets are longer than the transmission times of the second packets (designated as lower priority packets by Li), Li discloses that if one or more packets are being held by child scheduling engines 60 but none of them are eligible then the <u>virtual time</u> of the parent scheduling engine <u>is advanced to the start time of the packet or packets being held by child scheduling engines 60 which have the earliest start time</u>. The set of eligible packets is then identified based on the new virtual time (step 110). After a set of eligible packets has been identified, the parent scheduling engine 60 determines whether the eligible packets all have the same priority or have different priorities (step 112). If the set of eligible packets includes packets which have two or more different priorities, parent scheduling engine 60 identifies the highest priority assigned to one or more packets in the eligible set. Any packet in the eligible set which does not have the highest priority is removed from the set (step 118) (col. 13, lines 1-15). In other words, the <u>virtual time is advance by an interval of the packets being held by child scheduling engine.</u> In the case where only the highest priority packets remain in the eligible set as disclosed above, <u>the new virtual time represents the transmission intervals of the high priority packets such as real time packets</u> **as claimed**. Li still further discloses a situation where packets have one of two priority levels. Each packet may be a high priority (or "real time") packet or a low priority (or "best effort") packet. Simplified method 200 begins

by selecting all high priority packets which are currently queued (step 204).

The method continues by passing the one high priority packet having the

smallest finish time F (step 206). In the alternative, step 206 could pass the

packet having the smallest start time S. If there are no queued high priority

packets then the method **selects all queued low priority packets (step 208)**

and continues by forwarding the low priority packet with the smallest

finish time F (step 210)(claimed transmitting second packets that compose

the non-real time stream; col. 13, lines 35-49).

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Sol whose telephone number is (571)272-5949. The examiner can normally be reached on M-F 7:30am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/A. S./
Examiner, Art Unit 2419

/Wing F. Chan/
Supervisory Patent Examiner, Art Unit 2419
12/21/08